

STANDARD 4 – Wildlife/Threatened and Endangered Species/Fisheries Habitat and Weeds

Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.

Wildlife/Threatened and Endangered Species

1) Characterization

The plant communities/habitat types that occur within the Lower Platte Watershed have been described under the Characterization section of Standard 2 (Wetland/Riparian Health) and Standard 3 (Upland Plant Health). These habitat types vary greatly in their ability to support wildlife, depending on species composition, age classes, single-species dominance, horizontal and vertical structure, type abundance, mosaic mix with other habitats, and proximity to features such as migration corridors and winter concentration areas. Over 374 species of wildlife, including birds, mammals, reptiles, and amphibians, are known or expected to occur within the Rawlins Field Office (RFO). Graph #5 lists the number of wildlife vertebrate species by standard habitat types that are found within the RFO and have the potential to be located within this watershed. In general, aquatic habitats support the greatest diversity of species (up to 165) and are the least common types of habitat, comprising about one percent of the landscape. Aspen woodlands are next in terms of supporting the greatest diversity of species, followed by big sagebrush, conifer, mountain shrub, and juniper woodland habitat types. Big sagebrush and sagebrush/mixed grass are the most common plant communities in this watershed. Habitats with the lowest diversity of plants, cover, and structure, such as sand dunes, badlands, and rock outcrops, correspondingly support the lowest number of wildlife species (USDI-BLM, 2002).

The RFO Resource Management Plan (RMP) management objectives for wildlife species are to provide habitat quality (food, cover, space, and water) adequate to support a natural diversity of wildlife and fisheries, including big game, upland game, waterfowl, non-game species, game fish, sensitive, threatened, and endangered species, species of special management interest in Wyoming, as well as to assist in meeting goals of recovery plans. The RMP has an objective to maintain or improve vegetation condition and/or avoid long-term disturbance in high priority standard habitat sites and fisheries areas. In addition, there is an objective to also maintain or improve overall ecological quality, thus providing good wildlife habitat, within the constraints of multiple-use management in moderate and low priority standard habitat sites (USDI-BLM 1990). Although the RMP gives direction to manage the higher priority habitats first, there are circumstances when managing moderate and low priority habitats will take priority. Management of all three of these habitat types to obtain a diversity of vegetative species, cover, age classes, and structure is essential to maintain healthy wildlife populations and their associated habitat types.

The most commonly observed wildlife is big game, particularly antelope and mule deer in open habitat, and elk in shrub and woodland habitat. Raptors are also very abundant and include golden and bald eagles; ferruginous, red-tailed and Swainson's hawks; burrowing owls; and other hawks, harriers, and owls. Other commonly observed mammals are coyotes, red fox, badger, cottontail and jackrabbits, prairie dogs, ground squirrels, voles and mice. Shorebirds and waterfowl include great-blue herons, avocet, stilt, phalarope, sandpipers, coots, Canada geese, white pelicans, and other various ducks (primarily dabblers). Songbirds vary by habitat type, with sparrows, meadowlark and horned lark most often seen in sagebrush and saltbush areas, and warblers, swallows and flycatcher species observed in riparian habitats. Greater sage-grouse are an important species of interest. Horned lizards and prairie rattlesnakes are the most common reptiles, while tiger salamanders are the most abundant amphibian species.

Species of Interest or Concern:

There are numerous species of special interest and or concern that inhabit the watershed area, or use parts of the watershed area for migration, transitional zones and/or other corridors. There are six antelope herds, four elk herds, and five mule deer herds – all managed by the Wyoming Game and Fish Department (WGFD) - that are primarily located within this watershed. In addition, other species of special interest and or concern within this watershed include threatened, endangered, candidate, and proposed species (T&E species), BLM-State Sensitive Species, greater sage-grouse and raptors. Accounts of these are described in the following paragraphs. Crucial winter range for big game species are shown on Map #6.

Antelope

Pronghorn antelope are the most visible and numerous form of big game species in the Lower North Platte watershed (photo 39-1). Antelope rely heavily on Wyoming big sagebrush habitat, in addition to other ‘open’ communities like saltbush steppe, greasewood, and short grasslands. During the winter, antelope diets consist of primarily Wyoming big sagebrush. However, spring and summer diets include higher amounts of forbs, grasses, and other shrubs. There are three antelope herd units that are located primarily within the watershed area. These herd unit areas are identified as the: (1) Elk Mountain Herd Unit; (2) Iron Springs Herd Unit; and (3) Medicine Bow Herd Unit.

Elk Mountain Antelope Herd Unit: The Elk Mountain antelope herd unit is bounded by Interstate 80 to the north, the Colorado state line to the south, the North Platte River to the west, and east by the divide between the Laramie and North Platte Rivers. This herd unit contains WGFD Hunt Area 50; whereas only the northwest quarter of Hunt Area 50 is located within this watershed. This portion of Hunt Area 50 is classified as winter yearlong and crucial winter habitat for antelope.

Iron Springs Antelope Herd Unit: The Iron Springs antelope herd unit extends south from Rawlins to Sage Creek then to the southeast along the continental divide and is bounded by the Colorado state line to the south, Interstate 80 to the north, the North Platte River to the east. This herd unit contains WGFD Hunt Areas 52, 56 and 108. All of hunt area 56 is within this watershed as well as the northern third of hunt area 52 and the eastern half of hunt area 108. The majority of the herd unit is classified as winter yearlong habitat.

Medicine Bow Antelope Herd Unit: The Medicine Bow antelope herd unit is located northeast from Rawlins and is bounded by Interstate 80 on the south, Interstate 25 on the north, the North Platte River to the west and the Laramie Range on the east. This herd unit contains WGFD Hunt Areas 30, 31, 32, 41, 42, 46, 47 and 48, making it one of the largest herd units in the state. Only a small portion of hunt area 46 and the southern sixth of hunt area 48 are within this watershed. The area within the watershed is classified as winter yearlong habitat.

Elk

Elk are the third most common of the big game wildlife species that are in this watershed (photo 39-2). Elk normally prefer staying close to hiding cover, so are most often associated with conifer and aspen woodlands or tall shrublands. These are found on and near the Medicine Bow and Sierra Madre Mountains. They prefer grasses and have a high diet overlap with cattle, but will include more forbs in their spring diets and more shrubs in their winter diets. There are two elk herd units that are primarily located within the watershed area. These herd unit areas are identified as the: (1) Sierra Madre Herd Unit; and (2) Snowy Range Herd Unit.

Sierra Madre Elk Herd Unit: This herd unit includes the forest and rangelands south of Rawlins and between Saratoga and Baggs. It is comprised of the WGFD Hunt Areas 13, 14, 15, 21, and 108, of which only Hunt Areas 15, 21 and 108 is located within this watershed. This unit includes Atlantic Rim where smaller numbers of elk live

year-round, augmented by elk from the National Forest which move to lower elevations during the winter. Significant interchange of elk between Wyoming and Colorado occurs within this herd unit. Numbers of elk using the area around Atlantic Rim and have increased significantly in the last few years, which may in part be due to the prescribed burns that have increased the herbaceous component for that area.

Snowy Range Elk Herd Unit: This herd unit surrounds the Snowy Range of the Medicine Bow Mountains southeast of Rawlins to Laramie. It includes WGFD Hunt Areas 8, 9, 10, 11, 12, 110, 114 and 125. Hunt Areas 11, 12, 114 and 125 are partially located within this watershed accounting for nearly a quarter of the herd unit. Elk within this unit summer at higher elevations, but winter at lower elevations near or outside of lower timberline, avoiding areas with high human activities.

Mule Deer

Mule deer are the second most abundant big game species following antelope in this watershed (photo 40-1 and 40-2). However, mule deer are not found evenly distributed across the landscape. They prefer areas with hiding cover and higher precipitation sites with forbs, which tend to occur close to the mountains, rims, and along stream drainages and lakes. Mule deer select forbs and grasses when green and more nutritious, shifting to primarily shrubs in the fall and winter. Compared to antelope, mule deer prefer a mixture of sagebrush and other shrubs during the winter. There is one mule deer herd unit that is primarily located within the watershed area. This herd unit area is identified as the: (1) Platte Valley Herd Unit.

Platte Valley Mule Deer Herd Unit: This herd unit lies south and east of Rawlins including areas on the west slope of the Snowy Range to the east slope of the Sierra Madre Range. It is comprised of WGFD Hunt Areas 78, 79, 80, 81, 83 and 161. All of hunt area 83 and half of hunt areas 79, 80 and 161 are within this watershed. Many of these deer summer at higher elevations, but will migrate to lower elevations to winter.

Raptors

There are several raptor species that have been observed within the watershed area, or their nests have been identified within the area. Raptors that have known nests within the area include the bald eagle, ferruginous hawk, golden eagle (photo 40-2), Swainson's hawk, northern goshawk, great-horned owl, Cooper's hawk, prairie falcon, red-tailed hawk, burrowing owl, and kestrel. Although nests have not been identified for the northern harrier, long-eared owl, short-eared owl, and sharp-shinned hawk, these species have the potential to nest within this watershed. The bald eagle is a threatened species; the ferruginous hawk, burrowing owl, and northern goshawk have been identified as BLM-State Sensitive Species. These species will be discussed in their respective section of the document as well.

Hawks

The sharp-shinned hawk is found in mixed deciduous and coniferous woods during the summer season; and winters in woods and near bird feeders. These hawks feed by catching small birds in midair and carrying them off to eat. They may also be seen hunting among bird feeders. The Cooper's hawk inhabits mixed forests and open woodlands. This hawk has regular feeding routes during the breeding season where it hunts for common medium-sized birds such as mourning doves, jays, and starlings. The northern goshawk inhabits deep woods with mostly conifers. These hawks feed on birds by catching them in the air, and feed on mammals by swooping down on them. They eat medium size birds and mammals such as grouse and squirrels. The Swainson's hawk inhabits prairies and open arid land. This hawk often feeds by hopping on the ground, eating insects such as grasshoppers and crickets. They soar and catch mice, rabbits, lizards, frogs, and birds. The red-tailed hawk inhabits a variety of open habitats. This hawk may perch, hover, or hold still into the wind when hunting. This hawk eats small

mammals, birds, and reptiles. The ferruginous hawk inhabits arid open land and grasslands. This hawk feeds by swooping down on prey from the air. They eat mostly medium-sized mammals, reptiles, and insects.

Owls

The great-horned owl inhabits extremely varied areas including woods, deserts, and suburbs. This large fearsome hunter will capture a wide variety of prey, ranging from insects to prey the size of a great blue heron. They eat squirrels, mice, rabbits, snakes, skunks, weasels, porcupines, domestic cats, crows, ospreys, as well as other owls and hawks, including barred owls and red-tailed hawks. The burrowing owl inhabits open plains, grasslands, and desert scrub. These owls eat insects, scorpions, crayfish, mice, ground squirrels, young prairie dogs, rabbits, amphibians, snakes, and rarely birds. The long-eared owl inhabits woods and willow patches near open fields and marshes. This owl eats mostly voles and mice, but has been known to eat amphibians, reptiles, and insects. The short-eared owl inhabits open fields, marshes, dunes, and grasslands. This owl feeds mostly on voles, but will also hunt songbirds and some game birds. They hunt mainly at dawn and dusk.

Other Raptors

The golden eagle inhabits mountains, foothills, and adjacent grasslands. This bird hunts by soaring and then diving down on prey such as rabbits and rodents and some birds, and they also feed on road-killed animals as well. The prairie falcon inhabits the plains, grasslands, and other open country. This raptor catches birds in midair or on the ground; and mammals after a swift swoop. The northern harrier inhabits open fields, grasslands, prairies, and marshes. This raptor feeds by coursing close to the ground and quickly swooping down on its prey. They eat mice, rats, birds, snakes, frogs, and other small mammals. The kestrel inhabits a wide variety of open habitats, including urban areas. This raptor hunts by perching or hovering, then diving to catch prey. They eat voles, mice, birds, and insects (Stokes 1996).

Threatened, Endangered, Proposed, and Candidate Species:

There are six threatened, endangered, proposed, and candidate species (T&E species) that occur, or have the potential to occur, within the watershed, and six species – the North Platte River species – that do not physically occur within this watershed, but may be affected by actions that occur within the watershed. These include the bald eagle, black-footed ferret, Canada lynx, North Platte River species (least tern, pallid sturgeon, piping plover, whooping crane, Eskimo curlew, and western prairie fringed orchid), Ute ladies' tresses, and Western boreal toad. T&E species that are located within the RFO, but that do not occur, or do not have the potential to occur and/or are not affected by actions within this watershed include the blowout penstemon, Colorado butterfly plant, Colorado River species (bonytail chub, Colorado pike-minnow, humpback chub, and razorback sucker), Preble's meadow jumping mouse, Wyoming toad, and yellow-billed cuckoo.

Bald Eagle

The current status of the bald eagle is threatened. Bald eagles are found in conifer, cottonwood-riparian, and river ecosystems. They feed mainly on fish, but will also eat carrion and some small mammals. There are thirteen known bald eagle nests located within the watershed area.

Black-footed Ferret

The black-footed ferret is considered endangered and is the rarest and most endangered mammal in North America and receives full protection under the Endangered Species Act of 1973 (Act). This species lives in prairie dog towns and relies on prairie dogs for both food and shelter. The original range of the black-footed ferret

corresponded closely with the prairie dog, extending over the Great Plains area from southern Canada to the west-Texas plains and from east of the 100th Meridian to Utah and Arizona (USDI-BLM 2002).

Canada Lynx

The current status of the Canada lynx is threatened. Lynx occur in the boreal, sub-boreal, and western montane-forests of North America. Snowshoe hares are the primary food source of lynx, comprising 35-97 percent of their diet throughout the range. Other prey species include red squirrels, ground squirrels, mice, voles, porcupine, beaver, and ungulates as carrion or occasionally as prey. Lynx prefer to move through continuous forests and use ridges, saddles and riparian areas. Lynx have been known to cross large rivers and lakes and have been documented in habitats such as shrub-steppe, juniper, and ponderosa pine (USDI-FWS, 1999a).

North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, Eskimo Curlew, and Western Prairie Fringed Orchid

The North Platte River species include the endangered Eskimo curlew, interior least tern, pallid sturgeon, whooping crane; and the threatened piping plover and, Western prairie fringed orchid. These species are downstream residents of the Platte River, and the whooping crane is a migrant along the central Platte River in Nebraska. The bald eagle is also a downstream winter resident of the Platte River (FWS March 2004).

Ute Ladies' Tresses

Ute ladies' tresses is considered a threatened species under the ESA of 1973. This plant is a perennial, terrestrial orchid. This plant blooms from late July through August; however, depending on location and climatic conditions, orchids may bloom in early July or still be in flower as late as early October. This orchid is endemic to moist soils in mesic or wet meadows near springs, lakes, seeps, and riparian areas within the 100-year flood plain of perennial streams ranging from 4,300-7,000 feet in elevation. It colonizes early successional riparian habitats such as point bars, sand bars, and low laying gravelly, sandy, or cobbly edges, persisting in those areas where the hydrology provides continual dampness in the root zone through the growing season (USDI-BLM 2002).

Western Boreal Toad

The Western boreal toad (boreal toad) is a candidate species under the ESA of 1973. This species is found in riparian areas above 7,500 feet in elevation adjacent to and within the Medicine Bow National Forest (USDI-BLM 2002).

BLM State Sensitive Species:

Many wildlife and plant species are experiencing population declines. The BLM developed a sensitive species list to better manage species and their habitats. There are 24 BLM-state sensitive species that have the potential to occur within this watershed. These species include six mammals, fourteen birds, and four plants. The BLM state sensitive fish, reptiles, and amphibians that may occur within this watershed are discussed in the Fisheries section. The BLM state sensitive mammals that have the potential to occur in this watershed, or that may migrate and/or travel through the watershed area include the long-eared myotis, fringed myotis, Townsend's big-eared bat, white-tailed prairie dog, Wyoming pocket gopher, and swift fox. The BLM state sensitive birds that have the potential to use this area include the white-faced ibis, trumpeter swan, northern goshawk, ferruginous hawk, peregrine falcon, greater sage-grouse, long-billed curlew, burrowing owl, mountain plover, sage thrasher, loggerhead shrike, Brewer's sparrow, sage sparrow, and Baird's sparrow. The BLM state sensitive plants that may occur in this watershed, or have the potential to occur in the watershed include the Nelson's milkvetch, cedar rim thistle,

Gibbens' beardtongue, and persistent sepal yellowcress. A description of the habitat type that each species is associated with is shown in Table 3.

Table 3: BLM State Sensitive Species That May Occur In The Watershed

Mammals		
Common Name	Scientific Name	Habitat Types
Long-eared myotis	<i>Myotis evotis</i>	Conifer and deciduous forests, caves and mines
Fringed myotis	<i>Myotis thysanodes</i>	Conifer forest, woodland, caves and mines
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Forests, basin-prairie shrub, caves and mines
White-tailed prairie dog	<i>Cynomys leucurus</i>	Basin-prairie shrub, grasslands
Wyoming pocket gopher	<i>Thomomys clusius</i>	Meadows with loose soil
Swift fox	<i>Vulpes velox</i>	Grasslands
Birds		
Common Name	Scientific Name	Habitat Types
White-faced ibis	<i>Plegadis chihi</i>	Marshes, wet meadows
Trumpeter Swan	<i>Cygnus buccinator</i>	Lakes, ponds, rivers
Northern goshawk	<i>Accipiter gentilis</i>	Conifer and deciduous forests
Ferruginous hawk	<i>Buteo regalis</i>	Basin-prairie shrub, grassland, rock outcrops
Peregrine falcon	<i>Falco peregrinus</i>	Tall cliffs
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Basin-prairie shrub, mountain-foothill shrub
Long-billed curlew	<i>Numenius americanus</i>	Grasslands, plains, foothills, wet meadows
Burrowing owl	<i>Athene cucularia</i>	Grasslands, basin-prairie shrub
Mountain plover	<i>Charadrius Montanus</i>	Short-grass prairie, shrub-steppe, prairie dog towns
Sage thrasher	<i>Oreoscoptes montanus</i>	Basin-prairie shrub, mountain-foothill shrub
Loggerhead shrike	<i>Lanius ludovicianus</i>	Basin-prairie shrub, mountain-foothill shrub
Brewer's sparrow	<i>Spizella breweri</i>	Basin-prairie shrub
Sage sparrow	<i>Amphispiza billineata</i>	Basin-prairie shrub, mountain-foothill shrub
Baird's sparrow	<i>Ammodramus bairdii</i>	Grasslands, weedy fields
Plants		
Common Name	Scientific Name	Habitat Types
Nelson's milkvetch	<i>Astragalus nelsonianus</i> – or- <i>Astragalus pectinatus</i> var. <i>platyphyllus</i>	Alkaline clay flats, shale bluffs and gullies, pebbly slopes, and volcanic cinders in sparsely vegetated sagebrush, juniper, cushion plant communities at 5200'-7600'
Cedar rim thistle	<i>Cirsium aridum</i>	Barren, chalky hills, gravelly slopes, & fine textured, sandy-shaley draws at 6,700'-7,200'
Gibbens' beardtongue	<i>Penstemon gibbensii</i>	Sparsely vegetated shale or clay slopes – 5,500' to 7,700'
Persistent sepal yellowcress	<i>Rorippa calycina</i>	Riverbanks & shorelines, sandy soils near high water line

The objective of the sensitive species designation is to ensure that the BLM considers the overall welfare of these species when undertaking actions on public lands, and do not contribute to the need to list the species under the provisions of the ESA. The lack of demographic, distribution, and habitat requirement information compounds the difficulty of taking management actions for many of these species. It is the intent of the sensitive species policy to emphasize the inventory, planning consideration, management implementation, monitoring, and information exchange for the sensitive species on the list in light of the statutory and administrative priorities (USDI-BLM 2002).

Greater Sage-Grouse

Greater sage-grouse (grouse) are common inhabitants within this watershed (photo 43-1). Grouse populations have exhibited long-term declines throughout North America, with a 33% decline over the past 30 to 40 years. No one causal factor has been identified for these declines. Wyoming supports the largest populations of grouse, more than all the other states combined; however, there are population declines occurring in Wyoming as well. Grouse are a sagebrush obligate species and each aspect of their life cycle requires slightly different elements within the sagebrush communities. Grass height and cover play an important role in the nesting success of grouse. Early brood rearing habitats consist of relatively open stands of sagebrush or narrow, shrub-free stringers of meadows in draws or other areas with somewhat more soil moisture. Sagebrush, sometimes dense, often has invaded the latter habitats, thus making them less desirable or unsuited for brood habitat (Klebenow, D.A. 1972). During the summer

months, grouse move to more mesic sites seeking succulent forbs. Movements to winter ranges are slow and meandering and occur from late August to December. During the winter months, grouse feed almost exclusively on sagebrush leaves (USDI-BLM 2002).

Some winter habitat has been identified for parts of this watershed. Specific, project related areas were flown for winter habitat within this watershed; therefore, there is always the possibility that additional winter habitat areas for greater sage-grouse will be identified in other areas of the watershed unit. Winter habitat must be assessed during very specific time periods and under specific winter conditions.

2) Issues and Key Questions

There are several issues and key questions that have been identified for wildlife species. The major issues that concern wildlife species include the overall health of the ecosystem including both the quality and quantity of a diversity of habitat types that species depend on throughout their life cycles; the availability of these habitat types for wildlife species; and existing or potential disturbance of these habitat types. Priority wildlife habitats include riparian grassland, willow-waterbirch riparian, aspen and cottonwood woodlands, and wet forested meadow areas; in addition to open aquatic; sagebrush-grass communities, mountain shrub, saltbush steppe, conifer forest, and rockland areas (USDI-BLM 1990). Habitat diversity includes vegetation cover types and age distribution, as well as the need for disturbance-such as fire, disease, and/or climatic change. Factors that affect the availability of these habitat types for wildlife include livestock management, development of private lands, and inter- and intra-species competition for available forage and associated diet overlap. Existing and potential disturbances to wildlife species include impacts to priority habitats from fencing, water development projects, vegetative treatments, and livestock use; disturbance to individual life cycles from human activity, including recreational activities, OHV use, and noise. The following describes issues and key questions that pertain to specific wildlife and impacts that may occur as a result of activities occurring.

Species of Interest and Concern

Antelope

Issues that relate to antelope across the watershed include impacts of fences and roads upon animal movement; these will be discussed for all herd areas at one time. Issues that affect antelope which are more specific to particular herd areas (and will be discussed by herd area) include vegetation treatments, livestock management practices relating and type/season of use by livestock, and the development of private lands within checkerboard areas.

Much of the fencing in the assessment area was constructed prior to standards being created to reduce impacts on wildlife. Additionally, many road rights-of-ways are bounded by woven wire fences as well. Few adults will jump over fences; the majority of antelope prefer to pass under or through fences. Woven wire fences prevent passage under or through them, forcing antelope to find low spots such as gully crossings where they can get under the fence. During severe winter conditions, antelope have to expend additional time and energy to get through these types of fences while migrating, which may reduce their chance for survival. They may even get stuck in fences, where they are likely to die. Older fences built to control cattle were made with four to six strands of barbed wire, and the bottom strands are lower than the height recommended in BLM fencing standards. Although antelope can often pass through these fences or find low spots to go underneath them, they still impede migration movements to some degree. Modifications continue to be made to sheep style (woven wire) fences (photos 44-1,2 and 3), in particular, to reduce the impacts to antelope migrating between spring/summer/fall and winter ranges. Even though some of these have been modified to BLM fencing standards, to assist antelope in moving through fences, more needs to be done. In some cases, installing gates in corners that could be left open during the winter would help a

lot. Since not all of this work can be done at once, what locations should have the highest priority to be modified, and what areas should be targeted for future years? How can we accomplish the modification of a significant amount of fence each year to help resolve this issue in a reasonable amount of time?

Livestock management practices primarily relate to water, both in terms of new developments and their management, as well as protection of natural seeps and streams. When new water sources are developed, which are usually for summer cattle use, antelope and other wildlife will use them and become dependent upon them, especially during times of drought. However, if these water developments are wells, they may only be available during specific times of the year and the wildlife must look for water elsewhere. There have been incidents where antelope get stuck in certain pastures due to woven wire fences and can't move to new locations when the water they were using is no longer available. How can these situations be avoided? Are there certain times or locations when water should remain available, either through continuing to pump water or development of other sources? In other situations, water developments have been created for wildlife, such as guzzlers or other projects. These are often developed and maintained by individuals working for state or federal agencies, but may not be properly maintained when these individuals retire or move to other jobs. How can this situation be rectified to maintain the use of these facilities for the long-term benefit of antelope and other wildlife? About 90% of all livestock use is made by cattle, which have a low overlap in diet similarities with antelope. However, cattle can have a significant impact on riparian habitat that is important to antelope. Through the use of riparian pastures or exclosures, these areas are managed or protected from a livestock perspective, but from a wildlife viewpoint, what mix of vegetative species and structure should be promoted and what form of management will it take to achieve this?

Private land developments are another issue influencing antelope within the assessment area. These developments, primarily subdivisions, are resulting in a net loss of habitat that is important to antelope. Additionally, increased human activity associated with these developments may also result in an effective habitat loss of these areas.

Elk Mountain Antelope Herd Unit: Only about one-fourth of this herd unit lies within the watershed boundary with about 65% of that area in private ownership. In addition to livestock management and fencing (discussed under general heading for antelope), subdivision development within this herd unit is slowly removing small portions of usable habitat. In addition, these developments may also restrict movements as well as increase the amount of noise and disturbance.

Iron Springs Antelope Herd Unit: This herd unit is primarily influenced by fencing and livestock management issues that are discussed under the general heading of antelope. Vegetation treatments within this herd unit area, occurring within crucial winter ranges, could have positive or negative impacts, depending upon design and implementation. How can vegetation treatments be designed and implemented to maximize benefits and reduce adverse impacts to antelope?

Medicine Bow Antelope Herd Unit: This herd unit is primarily influenced by fencing, roads and livestock management issues as discussed under the general heading of antelope.

Elk

The major issues affecting elk are fence impacts on animal movement, competition with cattle for forage, reduced health and productivity of forest and shrublands due to the lack of natural fire, and increased human activities. Fencing and competition with cattle are issues common to both herd units and are discussed together. Topics of concern that are not common to all herd units are discussed for each individual herd unit.

Elk movement is affected by fences much differently than with antelope. Elk, being considerably larger, will generally jump over fences. However, young elk will have to pass under or through fences for a time and can get stuck behind a fence they can't get through or get a leg caught while attempting to jump a fence. Woven wire

fences constructed for sheep present problems for very young elk, but these fences usually are not over 40 inches tall, and can be jumped fairly easily by adult elk. Old style fences built for cattle may be 50 to 55 inches tall and present considerable problems for both young and adult elk. Elk which summer on the national forest may not have many fences to pass over until they migrate in the spring and fall to and from the winter range. Fence locations requiring annual maintenance due to big game movement are good indicators of areas where fence modifications should occur to reduce both the cost of maintenance and the impact to big game species. How can a program be implemented to modify fences where needed in the short-term, and correct all fences to meet BLM standards in the long-term?

Competition for forage between elk and cattle occurs to some degree. The percent diet overlap is around 80% for these two species. The fact that both elk herds are at or near herd population objectives would indicate that current levels of livestock use is not affecting elk numbers. In terms of there being available forage for use by both types of animals, this is probably true, but distribution of livestock use will affect where adequate forage is available and where elk have to move in order to find forage. Water development and improved riparian and upland range conditions are also affecting elk distribution and how long they stay in a particular area. Should more attention be paid to these changes in elk distribution and use patterns, and how does this reflect back on the management of cattle or other activities in these areas?

Sierra Madre Elk Herd Unit: Coalbed methane is in the initial stages of development on the west side of Atlantic Rim. Compressor stations, service roads, and pipelines associated with this development will increase access and may create disturbance to wildlife. Elk, of all of the big game species, have the lowest tolerance for disturbance and studies show them staying a mile or more away from roads with frequent human activity. The level of disturbance to elk will depend on the number of wells developed, their location and associated roads. Winter and transitional ranges may be affected, since in the past most of this area is inaccessible due to the amount of snow that collects in the area. The west side of this herd unit along highway 789 is also experiencing increased development for natural gas. The roads associated with this development increase the human presence in these areas, both by the commercial industry and by recreationalists throughout the year. What will be the cumulative affect of developing coalbed methane and conventional natural gas resources on elk within this herd unit? What mitigative measures can be implemented up front that will reduce the affect of this development upon this elk herd?

Snowy Range Elk Herd Unit: This herd unit is primarily influenced by competition with cattle for forage, reduced health and productivity of forest and shrublands due to the lack of natural fire, and increased human activities, which is discussed under the general heading for elk.

Mule Deer

The issues that relate to mule deer include fence impacts on animal movement, livestock management practices, health of shrub and woodland habitats, natural gas and coalbed methane field activities, and development of private lands. The affect of fences upon mule deer are similar to those described for elk. Mule deer will typically jump over fences, with concerns relating to fence height and the spacing of the top two wires. Young deer may have to pass under or through fences, so that woven wire fences raise the greatest concerns. The affect of development of private lands are similar to those described for antelope.

Livestock management practices that have the greatest effect on mule deer are fencing (already discussed), type of livestock use (cattle versus sheep), and management impacts to mule deer habitat, particularly riparian plant communities. Sheep diets are very similar to mule deer and antelope, so competition for forage can be an important factor. However, current use levels by sheep only make up ten percent of all livestock use, compared to the inverse of that 100 years ago. Use by cattle and mule deer primarily overlap in riparian habitat. Spring through fall use of riparian habitat by cattle has degraded the value of these sites for mule deer use, especially the woody plants which are important as forage and cover. Use of best management practices for cattle has improved many of these areas.

However, how can these BMPs become the standard operating procedure so that these kind of issues are no longer present?

Platte Valley Deer Herd Unit: The mule deer in this unit summer at higher elevations on the national forest, but migrate to winter ranges at lower elevations. Therefore, habitat quality on winter ranges is a management consideration. Mature to decadent mountain shrub communities increase inter- and intra-specific competition. Can habitat improvement projects, including the use of prescribed fire be used to improve habitat conditions?

Raptors:

Raptors are primarily affected by the abundance of their prey species, which will fluctuate annually as a result of habitat and climate conditions. Factors that influence habitat condition and availability include the impacts that may occur from oil and natural gas development, recreation (falconry practices), subdivision development, and livestock management (condition of habitat for food base). What types of impacts are affecting raptors and what types of mitigation can be implemented to reduce and or eliminate these impacts?

T& E Species:

The issues are closely associated with the health and diversity of habitat types. In general, a healthy ecosystem lends to the survivability and vigor of T&E and BLM-State Sensitive species.

The only issue relating to bald eagles in this watershed center around the health of riparian vegetation, specifically the health and vigor of cottonwood trees along the North Platte River system. Livestock may affect tree health and vigor along the river system if there is excessive rubbing and browsing that can damage young trees. Lack of high flow events may reduce the regeneration of young cottonwood trees. What areas on public lands are being used by bald eagles; is there nesting activity; and if so, how successful are they? What types of impacts are attributable to cattle and what actions can be implemented to reduce and or eliminate them?

The only issue relating to black-footed ferrets would be potential impacts to white-tailed prairie dog towns (the major food base and habitat for black-footed ferret) that may occur as a result of recreational activities and subdivision development. In general, livestock management should not impact potential black-footed ferret habitat. Where are impacts to white-tailed prairie dog towns occurring? What affects has plague had on prairie dog populations?

There should not be any management issues with the Canada lynx since this species only use the riparian habitats between ranges during dispersal and it would be unlikely that this species would be traveling through the watershed, although this may occur. There should not be any impacts to this species as a result of implementing actions within the watershed.

The North Platte River threatened and endangered species utilize habitat located in Nebraska along the North Platte River. Factors which may affect these species relate to water depletions in the North Platte River system as a result of implementing proposed projects. A proposed project that may result in a water depletion, including evaporative losses, triggers a “may affect” situation and requires a biological assessment to be prepared. Formal consultation with the U.S. Fish and Wildlife Service is required. How many projects within this watershed that have been determined to cause a water depletion to the North Platte River system and have these depletions had any affect on local populations?

Ute ladies’ tresses is a plant that is located in riparian habitats. This plant is listed as a threatened species and may be impacted by livestock grazing, but grazing may not cause irreversible impacts to the species. It is considered a “take” only if the entire plant, roots and all, are removed, and grazing does not do this. What locations are most

likely to support this plant in order to inventory and determine if it even exists in this watershed? If populations are found then further steps in analyzing current and future management practices would occur.

The Western boreal toad may occur in riparian habitats within the Sierra Madre and Medicine Bow mountain ecosystems. Projects that occur in riparian habitats above 7,500 feet should be assessed for boreal toads. If the toad is found, what protection measures, if required, will be implemented to protect the species?

BLM State Sensitive Species:

There are six mammals, fourteen birds, and four plants that have been identified as BLM state sensitive species and may occur, or have the potential to occur, within this watershed area. The main key issues include the lack of information concerning exact locations of most of these species and the affects that authorized actions may have on these species. Monitoring has occurred, and will continue to occur, throughout the watershed area for the greater sage-grouse. There are numerous questions concerning this species - for example, what affects do vegetation treatments (prescribed burns, chemical treatments), grazing management, natural gas development, recreational activities, private land development, and roads have on these species? What affects do management practices have on other sensitive species located within the watershed? How much information should be obtained concerning specific species before land management actions are implemented?

Greater Sage-Grouse

Approximately 77 greater sage-grouse leks and associated nesting habitat occurs within this watershed. Upland drought reduces the amount and height of vegetative cover, which may lead to lower nesting success and chick survival for the next year. Drought also affects the production of understory forbs, which may have negative impacts to early brood-rearing, specifically from April through June, which is their critical time period. Water sources placed in the uplands may increase cattle use in areas that grouse use for nesting (photo 48-1). This may affect grouse nesting success and survival of chicks by further reducing herbaceous cover. Livestock use on some riparian habitats has led to degradation of species, vigor and cover that is important to late season brood-rearing by sage grouse. What levels and seasons of use by livestock in upland and riparian habitat are appropriate in conjunction with the needs of sage grouse and other wildlife? Habitat loss from subdivision activities continues (WGFD 2003e). Large scale sagebrush treatments may cause negative impacts if located in nesting habitat, but smaller scale sagebrush habitat conversions (less than 200 acres in size) may actually cause beneficial impacts to nesting grouse. Fences constructed next to strutting grounds may also cause negative impacts to grouse by becoming perches for raptors or obstructions to fly into. What are the cumulative impacts to greater sage-grouse as a result of authorizing actions including livestock management and associated projects (water development, fences, habitat treatments), and recreation activities? What educational programs can BLM become involved in with to reduce and or eliminate impacts to grouse within and adjacent to private parcels?

3) Current Conditions:

The following describes the current conditions of wildlife populations and their habitat for those species that inhabit the watershed, or have the potential to use habitats within the watershed.

Species of Interest or Concern:

Antelope

Elk Mountain Antelope Herd Unit: The population objective for this herd is set at 5,000 antelope, with the current population estimated at approximately 4,800. This herd has been stable for the past ten years with no signs of population increase. The lack of apparent population grow is attributed to drought conditions, since the summer

of 2000. Current data also suggest that the sagebrush habitat in the area is monotypic, old-aged decadent stands, which may not be able to support substantial increases in the antelope herd in the area (WGFD 2003c).

Iron Springs Antelope Herd Unit: The population objective for this herd is set at 12,000 antelope. The 2003 post hunt estimate for the herd showed approximately 8,500 antelope. Low fawn production in the past has slowed the growth of this herd since heavy winter losses in 1992-1993. Fawn production has improved in the past five years with a fawn:doe ratio of 61:100 observed in 2003. Once again, the recruitment into this herd may be slowed by drought conditions in the past, and may continue into the future if conditions remain the same (WGFD 2003a).

Medicine Bow Antelope Herd Unit: This herd unit has a population objective of 60,000 antelope and a current population estimated at 50,800. The herd has been slowly increasing since 1995, but has not shown the growth that would be expected in these areas. The fawn:doe ratio was estimated at 62:100, which is considered low in this herd unit. The slow increase in population may be due to the drought conditions that have persisted since 2000. Habitat conditions, resulting from consecutive years of drought conditions may also be a factor in the lack of population growth (WGFD 2003c).

Elk

Sierra Madre Elk Herd Unit: Population estimates for this herd have been complicated due to the extensive interchange of elk between Wyoming and Colorado. The herd has been above population objective since the mid-1980s, with post-season populations of nearly 8,000 animals. Adjustments in annual harvest have lowered elk populations to around 5,300 animals and closer to the objective of 4,200 animals (WGFD 2003b). The National Forest and surrounding foothills have been less affected by drought than areas to the west, north and east. There is generally good distribution of reliable water sources between streams and man-made developments. Over the last fifty years there have been many vegetation treatments on public, private and state lands to promote more grass and forbs for cattle, which also benefits elk. Removal of 600 head of wild horses in 1986 from this herd unit also benefited elk, particularly on their winter range, due to the high diet overlap between these two species. An improvement in livestock management with adoption of BMPs has improved range conditions that benefit elk. All of these factors are reflected in both the productivity of this herd and their expansion of use into areas further away from the forest.

Snowy Range Elk Herd Unit: The population objective of this herd is set at 6,000 elk. The population was expected to number 5,800 elk, following the 2003 hunting season. An estimated calf:cow ratio of 50:100 and excellent bull:cow ratios has been documented in the herd. Due to drought conditions, that threaten to continue, there is concern over habitat quality and livestock conflicts within this herd unit, especially on seasonal ranges off the National Forest. Due to these factors, the herd will be managed, for a time, to reduce herd size even further, mainly by a reduction in the number of cows in the population (WGFD 2003c). By maintaining the herd below objective, substantial habitat degradation, due to drought conditions, can be minimized in this area.

Mule Deer

Platte Valley Mule Deer Herd Unit: This herd remains above the population objective of 20,000 deer by nearly 6,000. Even though this herd is above objective, public concern has been raised that this herd area could support a significantly larger population. Precipitation was only 75% of normal during the winter of 2002-2003. Additionally, browse production was 27% lower than in 2001. The buck to doe ratio was similar to 2001, but the fawn to doe ratio was 10 fawns per 100 does higher than in 2001, at 66:100 (WGFD 2003c). Because this herd has not shown much improvement in population size, it is believed that habitat conditions are a large factor affecting this herd. As drought conditions persist, habitat conditions within the herd unit may show little improvement. A cooperative, interagency program has been initiated to treat big game habitat that is dominated by decadent stands of sagebrush in order to improve habitat conditions in the area. The plan, spanning 25 years, is intended to improve

habitat conditions in the area and hopefully alleviate some of the problems relating to historic overuse by big game and livestock; and the effects of continual fire suppression in the area.

Raptors

The raptors previously listed all nest and forage within the watershed. Bald and golden eagles often stay year-long, while other species migrate to warmer climates. The rough-legged hawk spends the winter in the watershed and migrates further north to nest. Prey species are common, with their abundance varying year to year due to climate. Monitoring occurs in some areas of the watershed to determine nest activity and status. Timing stipulations to avoid disturbance during nesting seasons are used on a project specific basis. Most Nest sites are found on natural substrates, however, artificial nests are used to mitigate conflicts between human activities and nest locations by ferruginous hawks and golden eagles.

Threatened, Endangered, Proposed, and Candidate Species:

The following paragraphs describe the current status of threatened, endangered, proposed, and candidate species that may occur, or have the potential to occur within this watershed. Species may use portions of the watershed during their entire life cycle or portions of their life cycle.

Bald Eagle

Although there are thirteen known bald eagle nests located along the North Platte River drainage at this time, the actual number of nests that may occur within the watershed have not been updated. Winter habitat has not been identified in the RFO area.

Black-footed Ferret

There are white-tailed prairie dog towns located within this watershed and many of these towns are active. The Bolten Ranch Complex remains non-block cleared for Black-footed ferrets and at this time, an actual map of all of these towns has not been completed. Survey and intensive mapping would be needed to refine any map that is prepared. Although prairie dog towns are located within this watershed, and some have the potential to support black-footed ferrets, no known black-footed ferrets have been recently identified within the watershed area.

Canada Lynx

Although it is highly unlikely that lynx will reside within this watershed, they may travel through the watershed, specifically using riparian habitats. Lynx are very secretive and are difficult to monitor; therefore, numbers of lynx are hard to obtain.

North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, Eskimo Curlew, and Western Prairie Fringed Orchid

The North Platte River species include the endangered Eskimo curlew, interior least tern, pallid sturgeon, whooping crane and the threatened piping plover, bald eagle, and Western prairie fringed orchid. Although these other species are not located within the watershed, other than the bald eagle, any proposed projects leading to water depletion within the North Platte River ecosystem must evaluate impacts to these downstream species.

Ute Ladies' Tresses

Although the Ute ladies' tresses has not been identified to exist in this watershed, it has the potential to occur and the Service has concluded that it may occur in this area.

Western Boreal Toad

Since the Sierra Madre and Medicine Bow mountains are located on the east and southwest of the watershed, there is potential for the boreal toad to be found in riparian areas.

BLM State Sensitive Species:

All of the BLM-state sensitive species have the potential to occur within this watershed. There are known nests for ferruginous hawks, and burrowing owls have been observed with some nesting habitat identified. Greater sage-grouse leks are monitored throughout the watershed by the WGFD and the BLM wildlife biologists from March through mid-May each year to determine activity status of each lek. Populations of greater sage-grouse are declining across the West and in Wyoming; however, the actual cause(s) for this decline is unknown. Less is known of other BLM-sensitive state species; however, the habitats for these species are present and inventory or monitoring should occur to determine abundance and habitat use in the future.

4) Reference Conditions:

There are several historical accounts that have described wildlife species that were present within the watershed area during different eras. The following are descriptions that were recorded by individuals or groups that traversed or lived in the watershed in historic times. Immediately following are historical descriptions of the area that were compiled by Robert D. Dorn. These excerpts include descriptions of the landscape and some of the wildlife that were present:

Laramie Plains, Medicine Bow Mountains, Elk Mountain Area

William H Ashley, a St. Louis fur trader, entered the Laramie Plains in March of 1825. . . As he proceeded north and west around the Medicine Bows he commented that, "I was delighted with the variegated scenery presented by the valleys and mountains, which were enlivened by innumerable herds of buffalo, antelope, and mountain sheep grazing on them, and what added no small degree of interest to the whole scene, were the many small streams issuing from the mountains, bordered with a thin growth of small willows and richly stocked with beaver." (Dorn 1986)

The U.S. Geological Survey under F. V. Hayden entered the area in October of 1870. . . On the plains antelope are still present but the buffalo have disappeared. Their old trails and skulls "are fast passing away." Elk, mule deer, whitetailed deer, bighorn sheep, wolves , and smaller animals "are still quite abundant, especially in the valleys of the small streams" in the mountains (Dorn 1986).

Fort Steele, Rawlins, Sage Creek Area

John C. Fremont, army topographer, visited the area in August of 1843. Buffalo were common in the vicinity. Toward the west there was "nothing to be seen but artemisia bushes." The hunters brought in a bighorn sheep from the Atlantic Rim area (Dorn 1986).

F. V. Hayden visited the area for geological explorations in September of 1868. "This vast barren sage plain stretches for westward [from Pass Creek] to Bitter Creek . . . In October 1870, Hayden was again through the area with the U. S. Geological Survey. The North Platte bottom had scattered narrowleaf cottonwoods but they were not abundant except near the mouth of Sage Creek . . . Beaver had cut large cottonwood trees near Fort Steele. These animals were abundant as they were not of much value at the time (Dorn 1986).

5) Synthesis and Interpretation:

From the accounts above, the detectable changes in wildlife are the disappearance of the buffalo, bighorn sheep, and wolves within this watershed. Livestock impacts, although still present, have been reduced, and range

conditions on upland and riparian habitats are improving in most areas (USDI-BLM 2002). Antelope, elk, and mule deer are generally thriving, and Wyoming has the largest population of greater sage-grouse in the country. Development in Wyoming has not occurred at the rate that it has in other states; thereby reducing the habitat loss and fragmentation. Native plant species are still present; weeds, although present in some areas, have not taken over large areas of the range. Impacts from off-highway vehicle use and loss of or modification to habitats from developments on private land in checkerboard areas continue to increase (USDI-BLM 2002). The lack of fire has led to a predominance of mature to decadent shrubs in some areas. The following analysis specific habitat conditions within the watershed and the effects these may have on wildlife species.

Species of Interest or Concern

Antelope

The presence of antelope in Wyoming was noted by all of the early explorers and emigrants that moved to or across the state. Antelope are still the most visible and abundant big game species in this area, due to open expanses of a sagebrush dominated landscape. The health of Wyoming big sagebrush communities that antelope depend upon is generally good. High cover and density of shrubs that limit understory species is only observed at higher elevations and precipitation. In this assessment area the crucial winter ranges do not receive enough concentrated animal use to show high utilization rates or severe hedge classes. There appears to be a good mix of winter, summer and transitional habitat to support existing populations and objective levels of antelope. The area along and north of Interstate 80, east of the North Platte River shows higher utilization rates within winter range areas. This is due to the increased use of the area where Interstate 80 has cut off historic migration corridors to winter ranges for antelope. Antelope, being the smallest of the big game species, is probably more susceptible to die-offs during severe winters. However, their reproductive capacity also allows them to respond more quickly after such events to repopulate their habitat.

The presence of many miles of woven wire fencing and its effect in hindering or altering antelope movement is the most important issue needing to be addressed. Research conducted in the early 1980's in the Red Desert antelope herd unit showed that woven wire fences were a significant impediment to antelope movement during severe winter weather. Modification of fence corners and other key locations should continue to be part of the annual goals and accomplishments of the Rawlins Field Office, in order to address this issue.

Private land that is developed into home sites could pose impacts, at an incremental rate, on antelope habitat and movement in checkerboard areas. Informing people about the potential impact to wildlife of these actions may help address this situation, or on a broader scale, exchanging lands to block up public land to maintain wildlife habitat should be pursued.

Livestock management affects antelope in a number of ways in addition to fencing. Sheep compete with antelope for forage; however, sheep use only makes up about 10% of all livestock use currently occurring in the Rawlins Field Office, so this issue is not as important as it would have been 50 years ago. Water development also can affect antelope. The creation of new sources of water has allowed antelope to expand their use into areas that formerly did not have reliable water. On summer range this is a benefit, but increasing seasonal use on winter range may have a negative affect on the vegetative resource. In these latter areas, the use of controllable facilities, like wells, is preferred in order to discourage year-long use of winter range by antelope. The problem of livestock water being turned off when wildlife use is still needed should be addressed on a case by case basis. This may vary depending on the climatic conditions experienced each year, what other water sources are available, and whether animals can move to water sources in other pastures or allotments. Water projects, developed for wildlife, that are in disrepair should be maintained or removed. Interest groups or individuals may be willing to voluntarily oversee and maintain these types of projects.

The Wyoming big sagebrush habitat that antelope depend upon as their principle habitat and forage source is stable and long-lived. While plant succession in this community type is relatively slow, it is occurring and changing over time. For antelope, greater sage-grouse, and other sagebrush obligate species, it is important to maintain healthy stands of big sagebrush, with a diverse mixture of grasses, forbs and shrubs. The use of prescribed fire, natural fire, or chemical treatments and their respective affects in this plant community are currently being studied in this watershed to try and answer some of the questions and improve future management.

Elk

Prior to the arrival of white men, elk were common plains inhabitants, but probably competed with bison for forage and space. At this time, elk are doing well across Wyoming and this watershed area follows a similar trend. All four herd units have current populations that are near or exceed population objectives. This would indicate that elk are thriving, have good reproductive rates, survival rates, and have the habitat to support them. In general, there are no significant problems with any winter or summer ranges that elk utilize. Drier conditions than average may have lowered calf survival rates. Although diet overlap is high between elk and cattle, there appears to be enough forage to provide for the needs of both at current levels of use. As best management practices for cattle continue to be implemented or improved, forage production and availability for elk should be increased. The practice of leaving gates open in pasture fences when they are not needed should also be promoted. In many cases this simple idea could help wildlife passage, especially during severe conditions.

In addition to fences and livestock management, these elk herds are affected by the increasing age and decadence of shrub and woodland communities, especially on crucial winter ranges. The loss of aspen habitat for cover and forage, especially later in the summer when forage in other areas has dried up, has negative impacts on elk. Water developments, improved livestock management, and vegetative treatments could all help improve the habitat for and distribution of elk in this watershed.

Mule Deer

Mule deer were common in this watershed historically, and are still common today. Trends in mule deer populations may be highly affected by conditions on crucial winter ranges. Poor fawn crops and die-offs during severe winter weather are climate related factors that can't be altered, but habitat and forage for mule deer are the factors that can be manipulated by land managers. The descriptions for Standards 2 and 3 indicate where improvement could occur, primarily in riparian habitat and shrub and woodland communities on and adjacent to the mountains. The dominance of mature to decadent mountain shrub communities is also affecting mule deer. The use of vegetative treatments or natural fire to promote a diverse mixture of species, age classes, and structure would also benefit mule deer populations. Riparian habitat is primarily influenced by cattle grazing. Use of best management practices would improve shrub and herbaceous species important to mule deer.

Development of private lands continues to slowly reduce the available winter range available to mule deer. Fences also impose barriers to mule deer in transition areas, especially during severe weather and also to fawns during the spring and early summer months.

Raptors

Raptors are primarily affected by climate (indirect affects on prey species) and human activities around nesting and perching areas. Ferruginous hawks and to a lesser extent golden eagles, will sometimes nest on or near man-made structures such as windmills, and old corrals buildings; or in areas with high levels of activity. Artificial nests are used to draw the birds away from these sites so that human activities do not force the abandonment of active nest sites. These artificial nests have also been documented to be more productive in terms of the number of birds fledged per nest compared to natural sites. There are currently 101 artificial nest sites, with about 50% being

actively used (photo 54-1). The BLM has a timing stipulation for raptors attached to any proposed project that is located within $\frac{3}{4}$ of a mile to one mile (depending on each species) from any nest, which prohibits surface disturbing and other activities from occurring between February 1 and July 31. In addition, the Bald Eagle and Golden Eagle Protection Act, 16 U.S.C. 668, prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing. The ferruginous hawk, northern goshawk and burrowing owl are BLM-State Sensitive species that are found within this watershed, while the peregrine falcon has the same status and has the potential to occur within this watershed.

Threatened, Endangered, Proposed, and Candidate Species:

The threatened, endangered, candidate, and proposed species that have the potential to occur within this watershed include the bald eagle, Canada lynx, Ute ladies' tresses (threatened); black-footed ferret and Western boreal toad (candidate). The North Platte River species (least tern, pallid sturgeon, piping plover, whooping crane, Eskimo curlew, and Western prairie fringed orchid) are not actually physically located within this watershed; however, water depletions that occur within the North Platte River system, and within this watershed, may cause an impact to these downriver species. The BLM wildlife biologists complete informal and/or formal conferencing and/or consultation with the Service for all proposed projects that may contain habitat, or the species themselves, to avoid adverse impacts to threatened, endangered, candidate, and proposed species.

Threatened Species

There are known bald eagle nests located within this watershed area and are commonly observed along the North Platte River. According to the Wyoming Game and Fish Department Bald Eagle Completion Report of 2002, the population of bald eagles statewide has continued to increase. In 2002, there were 95 pairs of bald eagles that produced 98 young in Wyoming (WGFD 2002d). Bald eagles are most commonly observed using cottonwood woodland habitat along major rivers. The majority of the habitat type within the RFO is located on private, state, and BOR administered lands. Bald eagles observed using BLM administered public lands are usually found scavenging big game or other wildlife carcasses in wintering areas. The BLM has a timing stipulation attached to any proposed project that prohibits surface disturbing and other activities from occurring between February 1 and July 31. This stipulation is attached to any project or activity that is located within one mile of a bald eagle nest. Generally, projects are not located beneath or even close to bald eagle nests; therefore, there should not be any impacts to nesting bald eagles as a result of authorizing actions on BLM-administered lands. In addition, the BLM has a winter raptor timing stipulation that prohibits surface disturbing and other activities from occurring between November 15 and April 30 for the protection of winter concentration areas.

The Canada lynx may travel through the watershed and use woodland and adjacent riparian habitats. The closest known lynx populations occur in the Colorado Rocky Mountains to the south and in the Wind River Mountains to the northwest. In general, there should not be any impacts to dispersing Canada lynx as a result of authorizing actions on BLM-administered lands.

The Ute ladies' tresses has not been specifically identified within this watershed. The only known locations within the State of Wyoming are located in Converse, Goshen, Laramie, and Niobrara counties at elevations between 5,000 and 6,000 feet. However, since the plant has been located in adjacent states, the Service believes it may occur in more locations within Wyoming. Site specific field investigations occur for all projects; therefore, the Ute ladies' tresses will be surveyed on any project that may be located within or near riparian habitat.

Endangered Species

The black-footed ferret has the potential to occur within the watershed. Since ferrets inhabit prairie dog towns, these sites are identified and delineated over broad areas or on a site specific project basis. All proposed projects have a field site investigation completed prior to disturbance to determine if suitable habitat for the ferret exists. Projects are located outside of suitable habitat or black-footed ferret surveys are completed. The BLM biologists informally or formally consult with the Service when black-footed ferret surveys are completed. There have not been any black-footed ferrets found in any surveys that have been conducted within this assessment area. In general, there should not be any impacts to the black-footed ferret as a result of authorizing actions on BLM-administered lands.

Candidate Species

The Western boreal toad has the potential to occur within riparian habitats above 7,500 feet in elevation. There is the possibility that this toad may be located in riparian/wetland habitat within the watershed. Site specific field investigations occur for all projects; therefore, the Western boreal toad will be surveyed on any project that may be located within or adjacent to riparian habitats above 7,500 feet in elevation. In general, there should not be any impacts to the Western boreal toad as a result of authorizing actions on BLM-administered lands.

BLM State Sensitive Species:

Protection measures for BLM-State Sensitive Species, other than those required for raptor, mountain plover and greater sage-grouse, have not been identified in the RFO area. The Migratory Bird Treaty Act, 16 U.S.C. 703, enacted in 1918, prohibits the taking of any migratory birds, their parts, nests, or eggs except as permitted by regulations and does not require intent to be proven. This Act and its regulations should protect the white-faced ibis, long-billed curlew, sage thrasher, loggerhead shrike, Brewer's sparrow, sage sparrow, and Baird's sparrow from actual destruction of the nests and or the bird itself. Habitat loss and/or degradation are more difficult to measure and mitigate for these species. The long-eared myotis, fringed myotis, spotted bat, and Townsend's big-eared bat usually inhabit caves, rocky outcrops, and abandoned buildings. Again, habitat loss and/or degradation is more difficult to measure and mitigate for these species. Wildlife biologists monitor white-tailed prairie dog towns for potential black-footed ferret habitat and protect these habitats by moving projects outside of the towns. There are occasions when a project may be constructed within white-tailed prairie dog towns after the towns are surveyed for black-footed ferrets and no ferrets or their parts are observed. Generally, project proponents are encouraged to move the projects outside of existing white-tailed prairie dog towns, not only for the protection of the prairie dogs themselves, but for other species such as the mountain plover and burrowing owl that depend on the prairie dog town ecosystem. The swift fox may travel through the watershed and should not be impacted by proposed projects that occur as a result of implementing BLM-authorized actions. A field site investigation is completed for all proposed projects and the BLM-State Sensitive plant species can be monitored at that time, and/or their likelihood of occurring should be noted in the event that additional field site investigations are required.

Greater Sage-Grouse

The greater sage-grouse is commonly found throughout the watershed area. Although Wyoming has a healthy but declining population of this species, there are opportunities to improve both upland and riparian habitats used by these birds. In many areas, existing grouse habitat exhibits reduced species diversity, forb abundance, and lacks sufficient residual cover for high nesting success. Greater sage-grouse habitat recommendations developed for Wyoming, which are based on research conducted within Wyoming, can be used for assessments to determine current conditions and where the need exists for vegetative treatments. Reclamation efforts should also receive more attention in terms of how it is completed, so that benefits to grouse can be maximized. In particular, the use of more forbs, including succulent species, should be considered in seed mixtures. Summer and fall brood-rearing habitat is especially dependent on riparian habitat, which is most influenced by livestock management. Stream segments that are in degraded condition are also not likely to provide high quality habitat for sage grouse.

Implementation of livestock grazing BMPs would improve the use of both riparian and upland habitats for greater sage-grouse. Creating new water sources for wildlife use and operating livestock water sources for wildlife when livestock are not present are two other methods of improving habitat use by grouse. Because of the increased habitat available, the dispersion of grouse throughout an area may reduce losses due to predation. Another tool the BLM uses is a timing stipulation attached to any proposed project that is located within two miles of a lek that prohibits surface disturbing and other activities from occurring between March 1 and June 30 for the protection of strutting and nesting greater sage-grouse. Generally, projects are not constructed within ¼ mile of an identified lek; and proposed projects should be moved as far away from an active lek as possible. The timing stipulation reduces impacts to breeding and strutting grouse; however, the two mile buffer has been debated by wildlife biologists. Recent research conducted within Wyoming indicates that only 40% of the hens nest within this two mile buffer. Suitable nesting habitat may be selected as far away as 20 miles from the lek. Because of this, suitable nesting habitat should be mapped in association with leks, in order to allow management of all nesting habitat available to the hens, not just within two miles of lek locations. The BLM has a winter greater sage-grouse timing stipulation that prohibits surface disturbing and other activities from occurring between November 15 and April 30 for the protection of winter concentration areas.

6) Recommendations:

Habitat needed to support healthy wildlife populations and listed or proposed threatened and endangered species is generally in acceptable condition. This does not mean that there aren't problems or concerns about wildlife habitat. The discussion under Standard #2 – Wetland/Riparian Health and Standard; #3 – Upland Plant Health; outlines the current conditions and recommendations for improving management of these resources. Although an area may meet a standard, it still may not be at our "desired or future" condition. On the other hand, our composition of native species is good, with some weed problems at this time. Due to the existing good condition of native vegetation and its ability to support the diverse wildlife populations we currently have, it is determined that the majority of Lower Platte assessment area is meeting Standard #4 with respect to wildlife. The following recommendations address actions to help meet future desired resource conditions.

Implement recommendations described for Standards #2 and #3. Improving the health of riparian/wetland and upland plant communities will help meet the needs of all wildlife, which use this watershed.

Species of Interest or Concern

Antelope, elk, and mule deer

Continue to modify existing woven wire fences and older cattle-type fences to meet BLM standards. This should be accomplished in key locations in the short-term, while working towards all fences in the long-term. Cooperative efforts should be pursued with grazing permittees, WGFD, and conservation districts. When possible, relocate or remove fences to reduce impacts to wildlife movements. Encourage livestock permittees to leave gates open through as much of the fall through spring seasons and/or when not needed, in order to help wildlife move between seasonal ranges. Documentation of locations where fences are affecting big game movements should continue.

Management plans should consider other grazers, such as wildlife in making recommendations and to properly assess impacts. Water developments should benefit as many species as possible, and should consider sustaining water in the summer, even after livestock have been moved. In winter ranges, projects should be controllable (ephemeral) in nature, to not encourage year-round wildlife use. Isolated water sources and associated riparian habitat should be protected and managed to meet the needs of wildlife. Monitoring information, particularly trend data for big game crucial winter range, should be coordinated with the WGFD for use in evaluating and changing herd objective levels.

Continue to implement vegetative treatments in shrub and woodland habitats to improve the diversity of cover, species, age-class, vertical structure, and mosaic mix of plant communities. Management efforts should also emphasize the use of naturally ignited fires to benefit resource values in accordance to preplanned conditions and objectives outlined in a Wildland Fire Implementation Plan. Monitor the effects for all treatment projects, to document and analyze results and improve future prescriptions to achieve management objectives. Utilize habitat recommendations for greater sage-grouse and other species where available in both assessing and planning habitat treatments. Encourage the development of interagency long-term habitat treatment plans (WGFD 2003b).

Evaluate the need and institute measures where necessary to reduce disturbance to big game species on crucial winter ranges, or other habitat areas where needed. This could involve seasonal closures of roads, seasonal closures of habitat for antler collecting, general off-highway vehicle use, and other activities. Private landowners should be encouraged to leave their lands unfenced, or use fence designs that are compatible with big game movements (WGFD 2003a).

Raptors

The BLM should continue to use the seasonal restriction stipulation for breeding and nesting raptors which prohibits construction and other activities from occurring between February 1 and July 31. In addition, the BLM should continue to use the seasonal restriction stipulation for identified raptor winter habitat areas which prohibits construction and other activities from occurring between November 15 and April 30. Monitoring efforts should continue, in order to determine the activity status of known raptor nests and to identify new nest locations.

Threatened, Endangered, Proposed, and Candidate Species:

Bald Eagle:

The BLM should continue to use the seasonal restriction stipulation for breeding and nesting bald eagles which prohibits construction and other activities from occurring between February 1 and July 31. In addition, the BLM should continue to use the seasonal restriction stipulation for bald eagle winter habitat areas which prohibits construction and other activities from occurring between November 15 and April 30.

Black-footed Ferret, Canada Lynx, Ute Ladies' Tresses, and Western Boreal Toad

The BLM should continue to complete informal and/or formal consultation with the Service for any proposed project that may be constructed within potential black-footed ferret habitat. Identified stipulations will be attached to all projects to avoid adverse impacts to the species.

North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, Eskimo Curlew, and Western Prairie Fringed Orchid

The BLM should continue to identify any proposed project that may cause depletions within the North Platte River system and should initiate formal consultation with the Service for each proposed project. Projects should not be implemented until after formal consultation has been completed.

BLM State Sensitive Species:

Greater Sage-Grouse:

The BLM should continue to use the seasonal restriction stipulation for breeding and nesting greater sage-grouse which prohibits construction and other activities from occurring between March 1 and June 30 of each year. In addition, the BLM should continue to use the seasonal restriction stipulation for greater sage-grouse winter habitat

areas which prohibits construction and other activities from occurring between November 15 and April 30 of each year. The WGFD should continue to delay the opening date of the grouse hunting season to the middle of September, as well as maintaining a short open season, which should reduce hunter numbers and harvest. This delay reduces the vulnerability of grouse, particularly productive hens, by delaying harvest until after broods have broken up flocks and moved from the easily hunted riparian habitats into the more difficult open sagebrush (WGFD 2003e). Implement (or continue) management and projects to improve greater sage-grouse habitat, including nesting cover and species diversity and age class structure in upland and riparian habitat (particularly forbs). Continue monitoring habitat trends and grouse use where possible before and after projects have been implemented.

Fisheries

1) Characterization

Regionally or Locally Important Recreational Fisheries:

Recreational fisheries within the analysis area include the Platte River, Jack Creek, Pass Creek, Sage Creek, and several small impoundments. These fisheries afford the opportunity to catch several species of salmonid fishes, including brown trout, rainbow trout, and brook trout. These fisheries represent a somewhat limited resource in this arid region of Wyoming. Specifically, the Platte River receives significant use within the analysis area and is therefore a priority for the BLM and cooperating agencies.

2) Issues and Key Questions

Vegetation Management

The potential impacts of livestock grazing on stream processes and fish habitats has been well documented (Armour et al. 1991, White 1996, Rinne 1999). They include the loss of stabilizing riparian vegetation which can lead to stream instability and an associated loss of habitat complexity, the loss of shading vegetation which can lead to elevated stream temperatures, increased sediment delivery, and loss of stream channel complexity provided by fluvial processes and woody debris.

The importance of landscape-scale disturbances resulting from either wildfire or prescribed fires to aquatic species and riparian ecosystems has recently received additional attention (Bisson et al. 2003). Natural disturbance regimes maintain the diversity of riparian ecosystems (Naiman et al. 1993). These disturbances can include fire and fire-related flooding, debris flows and landslides (Dwire and Kauffman in press). Additional riparian influences result from the vegetative responses to fires outside the riparian zone. A key example of this influence is the regeneration of quaking aspen that can result from the top-killing of aspen during a fire. The regenerated aspen are then available for instream uses by beaver.

Beaver Habitat

Beaver activity can have several benefits to aquatic ecosystems including elevated water tables that enhance riparian vegetation, reduction of stream water velocities that reduce erosional forces, stabilization of stream flows throughout the summer and droughts, improvement of fish habitats, improvement of terrestrial wildlife habitats (Olsen and Hubert 1994). The historic distribution of beaver colonies throughout the analysis area is unknown, but was likely correlated to areas containing healthy communities of willow or aspen. Limited availability of aspen and willow in the majority of the analysis area is thought to currently limit the suitability of the area for beaver colonization. This loss of woody vegetation can be related to many causes including livestock grazing, herbicide spraying, conifer encroachment, fire suppression, and wildlife grazing. A negative feedback mechanism often exists between the loss of woody vegetation and the water table of riparian systems. As woody vegetation is lost, the stream channel can become unstable and begin to actively incise. As this incision proceeds, the water table can be lowered and result in a reduction in the amount and area of woody vegetation available for beaver use.

Energy Development

Energy development activities are currently limited throughout the analysis area and are not thought to significantly affect fish habitats.

Transportation Planning

Roads can affect fish populations through fragmentation of habitats at road crossings, concentration of overland flow which can result in stream channel adjustments, and increased sediment delivery. Fragmentation of stream habitats can limit access to habitat features that are required by stream fishes. Stream fishes require habitats for spawning, rearing, feeding, and refuge from environmental extremes (Schlosser and Angermeier 1995). The spatial distribution of these required habitats can necessitate the seasonal movement of fishes among habitats. If barriers to movement are present, such as those caused by improperly designed road crossings, fish may not have access to all of the habitats necessary to fulfill their life history requirements. Additionally, barriers can interrupt metapopulation dynamics that allow for the recolonization of habitats that have experienced local extirpations.

Roads can also concentrate overland flow. This concentration of flow may generate greater water velocities that are foreign to the stream channel. The stream channel can, in turn, adjust to these increased velocities by changing its geometry through erosional processes such as channel incision.

Additional impacts of roads on fish communities are associated with increased sedimentation. The concentration of overland flow and increased rill and gully erosion associated with roads can affect required fish habitats. Increased sediment delivery to the stream can lead to the embedding of stream gravels. Some stream fishes require clean gravels for successful reproduction. Clean stream gravels are also necessary for the production of macroinvertebrates – a key food source for many stream fishes.

Invasive Species

On February 3, 1999, Executive Order 13112 on Invasive Species was signed. This order directed federal agencies to:

“use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them...” as well as “...not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.”

Introduced pathogens of concern in the analysis area include *Myxobolus cerebralis*, which can cause whirling disease in salmonid fishes, and Chytrid fungus, which can impact amphibian populations. Whirling disease is a parasitic infection that attacks the nerves and cartilage of small trout, reducing their ability to feed and avoid predators. These infections can significantly impact wild trout populations. Chytrid fungus has been cited as a cause of major declines in amphibian populations. The parasite responsible for causing whirling disease is known to occur at locations in the North Platte River drainage within the analysis area. Chytrid fungus attacks keratin of metamorphosed amphibians and can lead to 90-100% mortality in some species. The Boreal Toad Recovery Team (BTRT) has cited Chytrid fungus as a major concern in the southern Rocky Mountain population (BTRT, 2001). The occurrence of Chytrid fungus has not been documented in the analysis area. Both of these pathogens can be transported via contaminated waders or other equipment.

Invasive species of concern in the analysis area include zebra mussel and New Zealand mud snail. Zebra mussels have become widely distributed in the United States, particularly east of the 100th meridian. These exotic mussels have recently been discovered as near as Colorado, likely the result of overland transport by trailered boats. These

mussels can be found in large lakes, ponds, and river systems throughout their range in the U.S. A major transport mechanism of these mussels is through attachment to boats and trailers. New Zealand mud snails appear to prefer flowing water habitats with stable flows. Springs, spring creeks, and river sections downstream from dams are all places that they thrive in. They are most typically found on larger cobble substrates or on pieces of wood. These snails are known to occur in the Great Lakes region, as well as in isolated regions of the west, including Yellowstone National Park. New Zealand mud snails can be transported with fishing waders or other equipment that has been exposed to infected waters. The dispersal of these snails has been associated with recreational fisheries exhibiting high angler use. Neither the zebra mussel nor the New Zealand mud snail are currently known to occur in the analysis area and preventing their spread into this region will be particularly challenging.



Figure 1. Zebra mussel. Actual size is approximately $\frac{3}{4}$ inch.



Figure 2. New Zealand mud snail.

Nonnative fishes have been introduced and become naturalized in much of the analysis area. Their impact on native fishes is not fully described in this area. As in other areas of the West, the use of desirable nonnative fishes for their recreational and aesthetic values will need to be balanced with the needs of native fishes. Emphasis should be placed on managing habitats for a diversity of fishes, including providing habitats for native and desirable nonnative fishes.

3) Current Conditions

Fish habitat investigations have not been recently completed for recreational fisheries within the analysis area. Though PFC assessments do not constitute an assessment of fish habitat conditions, they are useful to determine factors affecting riparian and wetland systems. See Standards 2 and 5 for accounts of stream habitat conditions. Further investigations will be necessary to describe stream or wetland conditions as they relate to the habitat requirements of fishes.

4) Reference Conditions

References to historical stream conditions are limited. See Standards 2 and 5 for historical accounts of stream habitat conditions. Distributional changes of native fishes east of the Continental Divide were recently assessed by Patton et al. (1998). No trout species are native to the analysis area.

5) Synthesis and Interpretation

The analysis area contains several aquatic resources. These include recreational fisheries such as the Platte River, Jack Creek, Pass Creek, Sage Creek, and several small impoundments. The importance of these fisheries to the local economy and to the quality of life of the citizens of the area is likely significant.

The description for Standard 2, Riparian/Wetland, also applies in most cases to fisheries. Based on results from Standard 2, livestock grazing is the principle factor affecting riparian and wetland systems in the analysis area. Changing the season of use and/or shortening the duration of use are two methods for improving riparian habitat for fish. As streams improve in vegetative condition, water flows improve and temperatures are kept lower. The second factor needing attention is the lack of beaver and the habitat to support them. Beaver also improve water retention and lower temperatures due to their dams and ponds.

Baseline inventory information is lacking for native species of fish and wildlife throughout much of the analysis area. Though some broad-scale inventories have been conducted to identify trends in populations of native fishes in Wyoming, site-specific information required for effective land management is presently lacking.

6) Recommendations

The improved management of riparian habitats through the use of grazing BMPs indicates both an upward trend and meeting Standard #4 for fisheries for some of the streams in the assessment area. However, many other sites that should support fisheries currently do not. Standard #4 for fisheries is not being met on streams, which currently fail Standard #2 – Riparian/Wetland. There are also sites that are rated in proper functioning condition, but due to the lack of overhead cover (stream shading) exceed temperature requirements for some fish species and won't support them. However, these sites have not yet been defined. Due to the lack of credible data on the status of native fishes in the watershed, whether Standard #4 is being met for these species is unknown.

Describing the condition of aquatic systems using methods that incorporate the habitat requirements of fishes should be a priority. Completing inventories for native fishes and native amphibians, including boreal toad, should be a high priority for the fisheries program in coming years in order to identify site-specific land management opportunities.

Vegetation Management

In areas not meeting Standard 2, implement allotment management plans that will provide the amount of vegetation necessary to ensure adequate watershed protection under grazing use to perpetuate vegetation, enhance woody plant vigor, and assure soil stability.

Energy Development

Consideration of the viability of aquatic populations will be an important component of effective land use planning for energy development activities. These considerations should include obtaining baseline inventory information in proposed development areas, considering life history requirements of native species when designing transportation networks, and maintaining the integrity and diversity of stream and wetland habitats.

Transportation Planning

Designing road crossings that simulate natural stream processes would allow for the passage of aquatic organisms and allow access to habitats required by stream fishes. This can be accomplished by using a number of designs including bridges, bottomless culverts, and baffled culverts. Several references are available to help in this design process. Road designs should also consider appropriate energy dissipation in order to limit the concentration of overland flows and resulting sedimentation.

Invasive Species

Avoiding the transportation of invasive species to new habitats should be considered a high priority for the Rawlins Field Office. As the distribution of invasive species is not fully known, disinfecting equipment and materials that have been used in riparian or wetland environments should be considered standard precautions. All programs should use the chlorine bath maintained by the fisheries crew for disinfecting their equipment and materials before they are used in a new location. Instructional Memorandum No. WY-030-99-007 outlines required disinfection procedures for the Rawlins Field Office.

Weeds

1) Characterization:

Weeds, invasive non-native plants, ecologically threaten natural ecosystems and greatly impact natural plant communities throughout the West. The reduction of light, water, nutrients, and space available to native species can change the hydrological patterns, soil chemistry, erodibility, and may even change fire patterns on a localized basis (NPS ref). These invaders can reduce biodiversity, affect threatened and endangered species, change habitats and natural plant/animal associations, and prevent native species from remaining or encroaching upon a site. Weed infestations reduce forage availability for livestock and wildlife. Unlike many areas of the West, the Rawlins Field Office has a comparatively smaller weed problem than other areas in the Rocky Mountain region. The analysis area is relatively noxious weed free, with just small problem areas. The term *noxious* is a legal designation used specifically for plant species that have been determined to be a major threat to agricultural and/or natural ecosystems and are subject, by law, to certain restrictions. Invasive species include those that increase and invade disturbed areas and may or may not be able to invade native rangeland, and include noxious species. Within the analysis area, noxious and invasive species are predominantly found along roadways and other disturbed areas, and perennial waterways associated with recreational use, agriculture, and animal grazing activities. Road building, development, grazing, fire suppression, recreation, and other activities can directly increase weed establishment, introduction, and/or maintain their presence within the ecosystem.

The main noxious species present within the area are perennial pepperweed, Russian knapweed, and leafy spurge. Other noxious species include saltcedar, whitetop, Canada thistle, spotted knapweed, and Dalmatian toadflax. There are also several invasive species present which are normally restricted to disturbed areas. These include halogeton, Russian olive, Russian thistle, gumweed, cheatgrass, cactus, and several annual mustards. Most invasive species are not treated.

2) Issues and Key Questions:

The area is seeing an expansion of noxious and invasive weed species. Current issues in the assessment area follow:

- Noxious weeds and invasive species are spreading into undisturbed rangeland from the initial sites of introduction along many roadsides, livestock water developments, fishing access points, campgrounds, oil and gas developments, and other disturbed areas.
- Adequate mitigation measures are in place to address weed control on disturbed areas; however, enforcement of existing stipulations is spotty.
- Some private landowners adjacent to BLM land, especially in the checkerboard/intermixed land pattern areas, have yet to implement noxious weed management programs, thereby negating some of the potential effectiveness of treatments on BLM lands.
- Livestock movements are increasing weed presence in some allotments and more direct action is needed.
- Recreation is a factor in weed establishment and spread along the river and more direct action is needed.
- There are no reasonable measures available to control wildlife movements that spread weeds.
- Budget constraints do not allow for the treatment of all areas with weed infestations.

3) Current Conditions:

Weed locations are primarily restricted to disturbed areas associated with roads, irrigation, recreational use, and livestock grazing activities such as water developments. There are many areas where the noxious weeds are spread

throughout native rangeland. Some of these areas are being treated to contain the weeds where they are. A goal is to avoid having them spread elsewhere by vehicle, equipment, water, or animal movements. Most Federal, State, and county improved roads are being treated for weeds.

As stated earlier, the principle noxious species found within the analysis area include perennial pepperweed, Russian knapweed, and leafy spurge.

Perennial pepperweed grows up to four feet tall in waste places, irrigation ditches and hay meadows, wet areas, roadsides, and other higher water table areas. It is fairly aggressive and readily moves out into undisturbed rangeland and along watercourses. Although there is no scientific evidence, it is believed that pepperweed is toxic and could pose a threat to livestock. Most causes of suspected poisoning have occurred with horses being fed hay containing perennial pepperweed under confined conditions. An experimental weed burn was conducted on Little Sage Creek in the spring and fall following herbicide treatments along a limited portion of this drainage. This treatment resulted in removal of overstory basin big sagebrush and greasewood that limited weed control (photo 65-1, 65-2 pics). Following control both through prescribed burning and herbicide application perennial pepperweed was eradicated. However, other weed problems persist. Unfortunately, pepperweed occurs south of Rawlins along Little Sage Creek and its tributaries, above the confluence with Sage creek, as well as a few scattered patches in other drainages. There are also patches along Sugar creek. All known patches are being treated which involve approximately 200 acres.

Russian knapweed is a poisonous perennial, which forms dense colonies. It is a native of Eurasia and is found throughout the West. It spreads by seeds and adventitious roots that can penetrate up to eight feet, it is allelopathic, and is toxic to horses. Russian knapweed is found in many places throughout the assessment area. The North Platte River corridor has scattered patches totaling approximately 150 acres, which are spreading slowly, and most are not being treated as of yet. There are nearly 200 acres within the Sage creek/Little Sage creek drainages that are also expanding, and have received only limited treatment in the Little Sage creek area. Another area infested is within and adjacent to the railroad ROW, and associated roads east of the North Platte River. These are not presently being treated and are expanding. Twenty acres here are not meeting the standard. Total acres not meeting this standard are 370.

Leafy Spurge is a perennial, up to three feet tall, which grows basically anywhere. It is highly competitive and extremely difficult to manage (photo 65-3). Spurge contains milky latex, an irritant that causes lesions around the mouth and eyes of cattle when ingested. Spurge is known to occur along the North Platte River corridor and is not being treated. Wildlife appear to spread the spurge and are carrying it up from the river. This is observed along draws and shrub patches in small amounts of an acre or less in size. Altogether there are (at this time) an estimated known 100 acres of leafy spurge scattered along the river which are aggressively growing that do not meet this standard, most of which are not being treated.

Other noxious species present in the analysis area are:

Saltcedar is a deciduous shrub introduced from Eurasia as an ornamental (photo 65-4). In many places it has become naturalized along streams and reservoirs and tends to form monocultures that limit biodiversity. Saltcedar can transpire up to 200 gallons of water per plant each day and can dry up ponds and streams. In addition, they bring large amounts of salt up from the soil and deposit it on the surface, thus rendering adjacent sites uninhabitable by native species. This shrub is difficult and expensive to control. It occurs in isolated patches scattered throughout the analysis area, mostly south of Rawlins, which are treated as found. Sites found along Sage creek and Little Sage creek are mixed in with Russian knapweed and other weedy species, with acres failing this standard included in the acreage already listed for the knapweed. These photos show some limited treatment of these weedy areas, however, fluctuation of reservoir levels due to drought conditions has influenced control (photo 65-5, 65-6). Additional acreage of approximately 30 acres is not meeting this standard.

Whitetop (hoary cress) is a deep-rooted perennial up to two feet tall, which reproduces from root segments and seeds. It occurs on alkaline, disturbed soils along roads and the edges of meadows and irrigation ditches, and is highly competitive with other species. It can be mildly toxic to cattle and is one of the more difficult to control weeds. Whitetop occurs along roads and other disturbed areas throughout the analysis area. Most areas are not treated.

Canada thistle occurs in and along riparian habitat, and in some cases along roads where runoff water accumulates. As long as the riparian habitat is being properly managed, Canada thistle is not expanding and occupies the niche between the riparian and upland habitats. Canada thistle occurs basically throughout the assessment area and is treated along most main roads.

Diffuse knapweed is an annual or short-lived perennial, up to three feet tall. It grows along roadsides, disturbed areas, and dry rangelands, especially liking bitterbrush/bunchgrass communities on light, well-drained soils. Diffuse knapweed occurs in one known location west of Saratoga and has had mechanical and some chemical treatment. It is being spread by vehicles along roads and wildlife up from the roads. This area encompasses approximately 10 acres.

Dalmatian toadflax is a mildly poisonous perennial up to three feet tall, which reproduces by seed and underground root stalks. It is very aggressive, with a deep root system and a waxy leaf, which render it very difficult to eradicate. It usually prefers well-drained, relatively coarse-textured soils with low precipitation or soil disturbance. Toadflax can establish in naturally occurring disturbances or small openings in pristine areas and on rangeland in excellent condition. Once growth begins, condition of the rangeland does little to slow expansion of the infestation. Dalmatian toadflax occurs in two areas. There are small spot infestations starting along the roads, from vehicles spreading the seed, and in undisturbed rangeland from animals redistributing seed. Ten acres here fail to meet the standard.

The invasive species of concern are halogeton, black henbane, gumweed, and cheatgrass. Other invasive species include Russian olive, Russian thistle, cactus, and several annual mustards. Halogeton is widespread along disturbances areas including roads and areas where equipment is used. It often provides lush forage along roads due to the late summer flowering habit and added moisture from road runoff. Halogeton has also been known to kill cattle. Livestock are most affected when stressed or when they have no period of acclimation, as rumen bacteria adjusts up to 30% within 4-5 days. Black henbane is also poisonous and can expand rapidly in disturbed areas, so it is targeted for treatment, primarily along disturbed roads. Gumweed is native but excels in disturbed areas, especially during dry times. It can form nearly pure stands along roadsides and is unpalatable forage for all animals. Cheatgrass occurs sporadically throughout the assessment area. Disturbed areas along roads, corrals and salt blocks are common locations. However, it can also be found on rangelands on well-drained, disturbed soils, particularly on south and west facing slopes. Cactus occurs in a few places which have received historic spring use or overuse. Annual mustards and Russian thistle occur along disturbed roadsides throughout the area. These generally are not large-scale problems, but patchy ones. Russian olive is a fast-growing tree found in isolated patches along the river and some reservoirs. Most invasive species, including halogeton, are not treated unless they are interfering with reclamation of disturbances or are a fire hazard around well locations.

4) Reference Conditions:

“Early European settlers in North America inadvertently brought weed seeds with them, perhaps in the hay they brought for their animals or in the dirt they used as ballast for their ships, or even in their clothes or bedding. Some activities, such as clearing the land, opened up niches that created places for weeds to grow. Settlers also purposely brought plants from their ‘home country’ to reseed areas, make dye for clothing and use as ornamental plants. Some of these non-native plants became invasive, reducing the diversity and quantity of native plants. Weeds are

continuing to spread rapidly in many areas across the country. Weeds spread to an estimated 4,000 acres each day on public lands managed by the BLM and Forest Service” (BLM Noxious Weed Webpage).

Settlers along riparian corridors have historically impacted these areas by clearing the land, irrigation, and overall human presence-associated disturbances. These areas also tended to have higher concentrations of livestock, especially historically, when riparian systems were “sacrifice areas” and did not receive the management attention that they receive today.

5) Syntheses and Interpretation:

The highest priorities for treatment are the aggressive noxious weed species, such as the knapweeds, perennial pepperweed, toadflax, saltcedar, and leafy spurge, which are able to spread throughout stable native plant communities. These are promptly treated and monitored where possible, and are not specifically related to livestock grazing. Weed movement by construction equipment (not cleaning equipment between moves), and adequate weed control on mostly private land that could spread to public lands needs to be addressed. Where livestock grazing is contributing to the invasion or expansion of weed species, management must be adjusted.

A significant portion of the watershed has not been inventoried for weeds, but it is generally assumed that unless there are disturbances or close proximity to the North Platte River, there probably are not any weedy species present. The exceptions are where noxious weeds are already established in an area, and buffer zone inventories around the patches are not complete. In addition, weedy species along the North Platte River are increasing and a cooperative effort for control is needed due to the checkerboard land pattern. As native vegetation is reestablished, many of the invasive species will be crowded out. The species of long-term concern within the assessment area are the noxious species, Russian olive, cheatgrass, and halogeton.

6) Recommendations:

Due to the existing good condition of native vegetation and the weed treatment program in place to control and/or eradicate identified weed problem areas, it is determined that the majority of the watershed is meeting Standard #4 with respect to weeds. There are known areas of noxious weeds that are rapidly expanding and are not being treated. These areas affect approximately 1000 acres. The following recommendations, in addition to following the Rawlins Weed Prevention Plan (BLM, 1999), would expand upon the success already achieved and help to meet desired resource conditions in the future.

Continue inventory and treatment efforts in the area to identify and contain or eradicate noxious weeds. Continue to work with ROW/lease holders in their treatment of weedy species, as well as work with landowners on concurrent treatments with private lands. Enforcement of stipulations on ROWs to control weeds must occur.

Identify all weed species that need to be treated throughout the assessment area. Although some may not be a major focus for treatment, they can be a significant problem within localized areas. In addition, more education on weedy species (including landowners, recreationists, and equipment operators), and innovative ways to address weed infestation is needed for this watershed. The BLM proposes to ask for increased funding for ways to address these weed issues, especially along the North Platte River.